Claim Amendments

1. (Currently Amended) A spin-valve type magnetoresistance sensor comprising:

a free ferromagnetic layer;

a pinned ferromagnetic layer;

a non-magnetic spacer layer ~~which is~~ sandwiched between the free ferromagnetic layer and the pinned ferromagnetic layer;

an anti-ferromagnetic layer ~~which is~~ disposed adjacent to the pinned ferromagnetic layer;

a non-magnetic back layer ~~which is~~ disposed adjacent to the free ferromagnetic layer ~~and which is stacked~~ on ~~the opposite~~ a side of the free ferromagnetic layer ~~from~~ opposite the non-magnetic spacer layer; and

an electron-reflective layer ~~which is~~ disposed adjacent to the non-magnetic back layer ~~and which is stacked~~ on ~~the opposite~~ a side of the non-magnetic back layer ~~from~~ opposite the free ferromagnetic layer.

A2

2. (Currently amended) The sensor of claim 1, wherein the ~~anti-ferromagnetic layer is used to pin the direction of magnetization of the pinned ferromagnetic~~ electron-reflective layer comprises a tantalum oxide film formed from a tantalum layer having a thickness within a range of approximately 0.5 to 1.75 nm.

3. (Currently amended) The sensor of claim 1, wherein the electron-reflective layer ~~consists of~~ comprises an oxide.

4. (Currently amended) The ~~apparatus~~ sensor of claim 3, wherein the oxide ~~is~~ comprises a metal oxide.

5. (Currently amended) The ~~device according to~~ sensor of claim 4, wherein the metal oxide is formed by:

forming a metal film on the surface of the non-magnetic back layer; and

exposing the metal film ~~on the surface of the back layer~~ to an oxidizing atmosphere.

6. (Currently amended) The ~~device according to~~ sensor of claim 5, wherein the metal film ~~on the surface of the back layer is more readily oxidized~~ has a rate of oxidation that is greater than that of the non-magnetic back layer.

7. (Currently amended) The ~~device according to~~ sensor of claim 5 ~~further comprising forming~~ wherein the metal film ~~with~~ has a thickness within a range of approximately 0.5 to 1.75 nm.

8. (Currently amended) The ~~device according to~~ sensor of claim 1, wherein the non-magnetic back layer has a thickness within a range of approximately 0.5 to 1.5 nm.

9. (Currently amended) The ~~device according to~~ sensor of claim 1, wherein:

the non-magnetic back layer ~~is a metal; and~~

~~the metal acts as an oxidizing agent with respect to the electron-reflective layer~~ comprises Cu.

Claim 10 (canceled)

11. (Currently amended) An apparatus for sensing magnetic flux comprising:

a spin-valve type magnetoresistance sensor having:

a free ferromagnetic layer;

a pinned ferromagnetic layer;

a non-magnetic spacer layer ~~which is~~ sandwiched between the free ferromagnetic layer and the pinned ferromagnetic layer;

an anti-ferromagnetic layer ~~which is~~ disposed adjacent to the pinned ferromagnetic layer;

a non-magnetic back layer ~~which is~~ disposed adjacent to the free ferromagnetic layer ~~and which is stacked~~ on ~~the opposite~~ a side of the free ferromagnetic layer ~~from~~ opposite the non-magnetic spacer layer; and

an electron-reflective layer ~~which is~~ disposed adjacent to the non-magnetic back layer ~~and which is stacked~~ on ~~the opposite~~ a side of the non-magnetic back layer ~~from~~ opposite the free ferromagnetic layer.

Claims 12-20 (canceled)

21. (New) A spin-valve magnetoresistance sensor, comprising:

a free magnetic layer;

a pinned magnetic layer;

a nonmagnetic spacer layer disposed between the free magnetic layer and the pinned magnetic layer;

an antiferromagnetic layer adjacent to the pinned magnetic layer, the pinned magnetic layer pinned by the antiferromagnetic layer; and

a non-magnetic back layer disposed adjacent to the free magnetic layer, the free magnetic layer adjoining and being disposed between the non-magnetic back

layer and the nonmagnetic spacer layer, the non-magnetic back layer having a thickness within a range of approximately 0.5 to 1.5 nm;

an electron-reflective layer that adjoins the non-magnetic back layer on a side of the non-magnetic back layer opposite the free magnetic layer.

22. (New) The spin-valve magnetoresistance sensor of claim 21, wherein the electron-reflective layer comprises a tantalum oxide film.

23. (New) The spin-valve magnetoresistance sensor of claim 21, wherein the tantalum oxide film is formed from a tantalum layer having a thickness within a range of approximately 0.5 to 1.75 nm.

24. (New) The spin-valve magnetoresistance sensor of claim 21, wherein the electron-reflective layer comprises a large band gap semiconductor material.

25. (New) The spin-valve magnetoresistance sensor of claim 21, wherein the non-magnetic back layer comprises two or more non-magnetic metal layers.